N. A. C. A. BULLETIN

Vol. XXV, No. 20 June 15, 1944

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This Bulletin is published semi-monthly by the National Association of Cost Accountants, 385 Madison Ave., New York 17, N. Y. Subscription price, $10.00 per year. Entered at the Post Office, New York, N. Y., as second-class matter August 28, 1925, under the Act of March 3, 1879.

EDITORIAL DEPARTMENT NOTE

If he had not realized it before, the problems which have come his way during the war have convinced the industrial accountant that he must be a sort of jack-of-all-trades. The best accounting technician will have only limited usefulness to his company unless his accounting background is supplemented by an understanding of the other activities which make up the sum total of his company's operations. Not the least important of these activities is production control. The interrelation between accounting and production control require that each be developed and carried on with full understanding and in complete accord with the other. This is brought out by the two articles in this issue of the *Bulletin*. The first article provides a summary of the functions, tools, and duties of the production control department, while the second presents a case study, illustrating how production control, accounting, and other activities may be coordinated through a system of shop order and billing control.

The author of our first article, L. V. Bedell, served with the Aircraft Production Division of the U. S. Army on the production of fighting planes during World War I. Following the war he became Cost Accountant and Auditor for General Motors Corp. and later Assistant Treasurer of the Stutz Motor Car Co. In 1926 Mr. Bedell became associated with the International Business Machines Corp., first as a salesman, later as an executive, and ultimately in the positions of Executive Assistant and Plant Controller of the Endicott plant. More recently, having become vitally interested in production control, Mr. Bedell continued his progress in this field as Assistant Supervisor, Methods and Procedures, with the Lockheed Aircraft Corp. and as Production Manager with SKF Industries, Inc. At present he is Assistant Plant Manager of the Nassau plant of the Sperry Gyroscope Co., Inc.

The author of our second article, Earl K. Johnson, is a native Pennsylvanian, who received his business training at the Pittsburgh School of Accountancy Division of the Robert Morris School of Business. Following his graduation in 1934, he and his brother conducted a direct mail advertising business for about a year, which was interrupted when Mr. Johnson joined the Independence Shares Corp. of Philadelphia as Accountant in the Pittsburgh office. In 1939, Mr. Johnson joined the Robertshaw Thermostat Co. of Youngwood, Pa., as Cost Analyst, and in December of that year was transferred to a subsidiary, the American Thermometer Co. of St. Louis, to install a standard cost system. The present article is based on methods developed on that assignment.

Articles published in the *Bulletin* present many different viewpoints. In publishing them the Association is not sponsoring the view expressed, but is endeavoring to provide for its members material which will be helpful and stimulating. Constructive comments are welcomed and will be published in the Forum Section of the *Bulletin*.

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JUNE 15, 1944

PRODUCTION CONTROL AND PLANNING

**By L. V. Bedell, Assistant Plant Manager,
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IF WE can agree that the purpose of a manufacturing organization is to produce the required quantity of product, of the required quality, at the required time, by the best and cheapest method, then the responsibilities of production control and planning are the sum of the responsibilities of the whole organization. This paper will not attempt to cover that total responsibility. It will deal briefly, and probably inadequately, with today's industrial "whipping boy" variously identified on organization charts as the planning, production planning, or production control department.

Most of our metal working facilities are serving one customer —the Armed Forces of the United Nations. Our principal competitor is *time*. Probably our worst handicap is the necessity of spreading a thin veneer of skilled line supervision over an expanded manufacturing organization where six to nine months' service makes an operator a veteran. The results obtained by organizations that have multiplied their working force by fifteen to thirty in two or four years are little short of miraculous, even if, in the accomplishment, there appears to be a certain amount of chaos created along with the product. Most metal working manufacturing is accomplished by the use of intermittent processes applied to the fabrication of individual parts. The finished parts are later joined by a series of assembly operation into the saleable product.

Four Primary Facts

To control intermittent production, four primary facts must be established:

1. What work is to be done, i. e., what product or products, in what quantities must be produced.
2. How the work is to be done, i. e., what quantities and types of facilities, tools, and skills are required to perform the work.

3. Where the work is to be done, i. e., how much space is ideal, how much space is available, and what problems of utilization will occur in performing the work.
4. When the work is to be done, i. e., when is the first delivery promised, at what minimum rate must the product be delivered, and over what period of time will the minimum rate extend.

In many instances, *what* to produce is largely determined by our customers. Frequently this involves undertaking to produce articles new to the organization which require introducing new processes and new skills. If new products, involving processes and skills not previously employed by the organization, are undertaken, the pre-planning stage of production takes on greater importance and scope.

How the work is to be done involves designing and fabricating detail tools, and creating complete processing instructions for the guidance of the manufacturing organization. It may also include new machine tools and training of necessary operators.

Where the work is to be done has frequently meant a new plant, an addition to an existing plant, or the re-arrangement of work space and machinery to accommodate greater output, or to adjust to the demands of new products.

When the work is to be done has, in the past two years, been all too frequently "yesterday" but the demand for the impossible has frequently been almost met.

Responsibility of Production Control Unit

For our purposes, the production control unit is primarily responsible for the answers to the *when* of the four questions. In the process of answering the question in these days, they will need the assistance of all other units of the organization and, in the discharge of their responsibility, may frequently become temporarily unpopular with most of the organization.

Today, the production control unit should be a party to sales negotiations and the resultant establishment of delivery schedules, in order that adequate consideration may be given to changing conditions in the plant and the material market. Beyond these changing conditions is the greater responsibility of individual plant

deliveries, having far-reaching effects when tied to the over-all requirements of our one customer. Many plants supplying the Armed Forces could be in the position of failing to supply the nail for the shoe of the horse for want of which a battle may be lost.

Assuming that the production control unit has been given a product delivery schedule that is within the ability of the plant, their job consists of interpreting that schedule to the manufacturing organization in the form of information and instructions that will result in an orderly and effective utilization of the plant facilities and skills. The further responsibility of production control includes the preparation or receipt of returns and reports that will assist in eliminating conditions operating to prevent the planned accomplishment.

L. P. Alford, in his *Cost and Production Handbook*, says production or manufacturing is "the series of steps by which material is given new form in accordance with pre-determined intention, by the aid of machines and tools, and of labor, skilled and unskilled." The same author states as the Law of Control of Production: "Control will be effective in proportion to the accuracy of observation of every definite step in the series of changes being wrought in material, as to quantity, quality, time, and place."

Both the definition of manufacturing and the law of production control indicate the prime importance of material control and manufacturing information.

Tools of Production Control

Minimum tools of production control include:

1. Accurate and complete parts lists and bills of material for each product.
2. Perpetual inventory records of quantities of materials available, on order, required, and used.
3. Standard or accurately estimated processing times for each part and operation.
4. Plant capacity records in terms of machines and equipment installed and to become available in the immediate future.

5. Processing and routing instructions covering the manufacturing procedures approved for each part required to complete a saleable unit of product.
6. Working drawings of each part to be manufactured.
7. Records of special tools and inspection facilities available and soon to become available.

An explanation of the scope and possible use of these tools may indicate a system or procedure of production control.

Parts Lists

If we are to plan, schedule and control the *what* to produce, it is apparent that the product must be described in the same complete detail that is inherent in the manufacturing processes to be employed. A parts list must specify the number of pieces of each item required to assemble a saleable unit. The bill of material must accurately identify the quantity and type of raw material required to produce one piece of each item. Under the pressure of war's demands, this rather elementary requirement has been too frequently left to inadequate skills and experience.

Understatements in a parts list or bill of material will result in material shortages, expensive expediting, lost hours by men and machines, and delivery delays. Overstatements will result in excessive inventories, frozen capital, and conflicts with federal inventory control regulations. Accuracy in these basic records costs so little in time and ability that its absence is inexcusable.

Perpetual Inventory Records

Inventory records of quantities of materials available, on order, required, and some recent history of what has been used, are vital to the success of production control efforts. An accurate inventory record is dependent upon a combination of careful and accurate physical handling of parts and materials and equally scrupulous care in preparing and processing the records.

Inventory records need to be in an accessible form that is as simple as you can devise without sacrificing completeness. Accuracy and simplicity should be a part of every document whose use can, in any way, affect the inventory records.

Standard Time

The time required to perform each operation necessary to the completion of a saleable unit should be available to the production control unit in order to develop manufacturing schedules. Operation times should be expressed in hours and decimals of hours per piece for the actual time required to process the piece. If there is a measurable time factor necessary to prepare the work place, usually referred to as set-up time, this should be stated as a separate time element so that consistent over-all time may be calculated for varying lot sizes.

Machine Capacity

The corollary time factor related to operation time is plant capacity, expressed in terms of available machine hours. Plant capacity is the product of the number of machines of each type multiplied by the hours of work per day, week or month, that the equipment can be operated.

Limiting factors to continuous operation of equipment should be determined or estimated, such as the policy of employment, whether the entire plant will be manned for a twenty-four hour day or for a seven-day week, the down-time to be scheduled for meals and rest periods, and the allowance to be made for repairs to equipment.

The Operation Record

In order to schedule and control production, it is essential that manufacturing procedures be determined and furnished the processing departments in easily usable form. This information is frequently called on "Operation Record." The amount and kind of information included in an operation record varies with the variety and number of parts and operations the plant produces.

In any case, the operation record should direct the material to be worked on to the proper equipment and supply all the information necessary for the processing department to perform the work acceptable, both as to quality and quantity within the allowed time.

Working Drawings

Engineering drawings are rather universal in metal working plants. If your plant is a prime contractor to the Armed Forces,

you may be required to furnish a set of prints from engineering drawings covering the product you are furnishing. Frequently the manufacturing organization needs, and should have, working drawings that supply more information than is conveyed by engineering drawings.

Where very close tolerance work is required, the shop may need drawings that supply dimensional information at several stages in the processing of a part. Many plants have developed isometric drawings to assist the assembly departments where conventional drawings of complicated assemblies are difficult to interpret to employees of short service or limited skills.

Tool Lists

The fact that special tools and inspection facilities have been provided, must be made known to the processing departments. Such information is frequently conveyed by the operation record, but can also be made available in the form of tool lists, prepared for each operation on each part.

In the form of tool lists, the document may be used to assemble the tools and route them to the work place from a central storage area. The list may also be used to charge out the tools for the run of the lot.

Duties of Production Control Department

Having made provision to equip the production control department with these minimum tools, how are they to be used? The production control department must be internally organized to—

1. Analyze manufacturing authorizations and/or customers' orders;
2. Requisition, through the purchasing authority, materials and supplies required in the manufacture of the product;
3. Receive and identify all materials;
4. Store raw materials, finished parts, subassemblies, and finished products;
5. Issue materials to processing departments;
6. Handle intra-plant transportation, i. e., movement of materials from stores through processing;
7. Follow-up manufacturing schedules; and

8. As an added wartime responsibility, identify, segregate, and prepare for approved disposition, material involved in cancellations of orders.

Initiating Purchase and Shop Orders

The analysis of a manufacturing authorization or customer's order is the simple operation of multiplying each item of the product parts list by the number of units of saleable product called for by the authorization to develop the total quantity of each part to be manufactured. This analysis becomes more complicated as products are added involving common subassemblies and individual parts.

Having developed the quantity of each part required, the information is reflected in the finished parts inventory record. The finished parts inventory record is then scrutinized for the effect of this new demand on the existing inventory position, and the net requirements of each part are drawn off.

This net requirement is further analyzed to develop the raw material requirements to produce the parts. The raw material requirements are then reflected in the material inventory records, and the net demand for each item of raw material is drawn off, usually in the form of a requisition to the purchasing agency.

The requisition for raw material must carry the necessary delivery schedule information, providing for delivery sufficiently in advance of product delivery schedules to accommodate processing and assembly time cycles. As these requisitions are converted to purchase orders, that fact should be reflected in the inventory records, thereby adjusting the requirement position to an "on order" status.

Using the net requirements of finished parts as determined by comparing existing inventory position with new requirements authorized, shop orders are next prepared. In preparing shop orders, economical manufacturing quantities should be planned wherever the product delivery rate will permit.

Starting dates for each lot are based on the requested raw material delivery schedule, and the lead time for processing that is peculiar to the part to be manufactured. These shop orders are reflected on the finished parts inventory record and here again, a requirement position is converted to an "on order" status.

Preparing for Follow-Up

If we tie starting dates for shop orders to delivery dates of raw materials, then production control's follow-up efforts can be directed toward having material when wanted. The purchasing authority should not be relieved of the responsibility of obtaining the required material on time, hence production control should be able to follow-up by exception, rather than by item.

Based on shop orders, a comprehensive machine load should be developed and coordinated with previous commitments of plant capacity. The resulting "on order" or committed position of the plant's capacity should indicate potential bottlenecks and suggest the probable action to be taken well in advance of the actual occurrence.

As materials are received and transferred to stores, the facts should be recorded in the inventory records, converting an "on order" position to an "available" status. By arranging shop orders in a "hold" file by starting dates, the file can be pre-dated and be used as a final follow-up to minimize delays due to lack of material. Shop orders should be accompanied by, or synchronized with, the furnishing to the manufacturing division of process and routing information, special tool lists, working drawings, and material requisitions.

Dispatching

As shop orders are released to the initial operation, they become the responsibility of the dispatchers or control clerks of the production control department.

If we have had good tools, and used them well, our shop orders carry a starting date for each operation that is to be performed. These operation dates are based on time values and over-all schedules that should be met by normal effectiveness in the use of the tools and machines, specified by the operating instructions associated with the shop order. At each processing station the work to be done should be reviewed by line supervision and the dispatcher to insure that all needed information is available, that equipment and tools are in order, and that skill, adequate to the task, will be available on the starting date. The dispatcher is also responsible to see that materials and instructions are delivered to the work station.

When an operation is completed, the dispatcher has the further responsibility of seeing that the finished work is routed and moved to the succeeding control station or operation. If absolutely necessary, a report of all work completed at each operation or control station can be returned to a central point and arranged for reference, in its original form, or recorded in permanent form to serve the indicated needs. The cost of reporting and recording every movement of work is quite likely to be in proportion to the volume of transactions that are handled, but the value of the result is not necessarily so proportioned. If tools and their use are good, then controlling by exception is practical and less expensive.

Any reasonably effective job of pre-planning should result in a fairly high percentage of the plan being accomplished. We then need only to have reports on those conditions that may prevent the accomplishment of that remaining percentage of the work being processed.

As parts are completed and delivered to finished parts stores, the facts are recorded in the inventory records converting an "on order" position to an "available" status.

Assembly Control

The authorization and control of assembly operations may follow the pattern described for machining operations if the work is performed intermittently, and the completed assemblies go to stock, to be shipped or delivered as required by schedules.

If the assembly operations are repetitive and continuous, as is common in so-called "line" assembly operations, the authorization may be for a very long period of time and for a quantity of product per day, week, or month. In a line assembly, instructions, working drawings, special tool lists, and related information are usually supplied but once, whereas finished parts and supplies will be delivered to the work area as required to maintain the planned rate of output.

The movement of finished parts and supplies from storerooms to work place is recorded in the finished parts inventory records, and an "available" position is converted to a permanent record of the use of the item. Ordinarily the responsibility of production control should be discharged at about this point. However, no payroll was ever met short of the shipping platform and while

the production control department cannot be blamed for final inspection and test rejections, they should be the agency to follow up to see that the saleable product is delivered to the custody of the sales department, either in a storeroom under sales control, or to the shipping platform to meet sales department's instructions covering final delivery.

Conclusion

In this paper, the problems of forms, physical make-up of records, departmental titles, and similar subjects have been intentionally avoided. I hope this avoidance will cause no great disappointment. These are the tools of the trade, and few practitioners agree completely as to their make-up. Like any other tools, they need to fit the conditions and circumstances of use.

Neither has this paper attempted to discuss the problems created by machine and tool failures, unfilled material delivery promises, or the frailties of humans. Those problems must be solved or composed as they occur. The production control department's records may supply the degree of probability for occurrences of this sort, but no record yet devised, nor crystal ball yet invented, will foretell the exact time and place where any of these conditions will become apparent.

The production control department should be staffed by time-conscious people, familiar with products and processes, rather than with clerks familiar with the prescribed routine of a production control system, in order that the obstacles to the planned accomplishment may be promptly recognized and the remedies quickly applied.

ESTABLISHING CONTROL OF BILLING AND SHOP ORDERS

By Earl K. Johnson, Cost Accountant,
American Thermometer Co., St. Louis, Mo.

A MOST important activity in any business is the proper recording of the customer's order and its entry on the production schedule at the earliest possible date. This article will describe a procedure for the control of billings and shop orders, which

should be of general interest because the business in which it is used is typical of many small manufacturers. Not all of the procedure outlined is as yet in operation, but the portions not now operative are expected to be established in use within a few months. Since the system is flexible, it can be used now and in the post-war period without need for great alteration.

In most business organizations several departments must cooperate to get customers' orders into production. This is true of the business under discussion, and involves the issuance of several copies of the customer's order. Unless all copies of the order are identical, the departments will not be working in harmony. Under the system to be decribed, the duplicating machine is used to see that the basic information is the same on all copies of the order.

The products of the company in which this system was developoped are, in normal times, standardized to a considerable degree. While some orders are received for special products, these are handled under the same procedure as orders for standard products. Fabrication involves punch press, drill press, lathe, milling machine, heat treating, inspection and assembly operations. Standard parts are carried in stock in minimum quantities based on the current rate of usage. Perpetual records on all stock parts permit reorder when established minimums are reached.

The Master Order

When a customer's order is received in the sales office at the plant, it is processed to show the proper manufacturing part number, and for approval of credit and credit terms. The order is given to the billing clerk.

The billing clerk is in reality an order clerk. She not only bills the customer when shipments are made, but she writes the original master order which starts production. She is supplied with serially numbered master sheets of a form illustrated in Exhibit 1. The billing clerk must account for all serial numbers. When she types the master sheet from the original customer order which she received from the sales department, she types the serial number on it, so that it will show on all copies of the order. The master sheet is then ready for the duplicating machine operator.

For purely internal control reasons, the duplicating machine operator is under the supervision of the inventory control office.

The duplicating machine operator is provided with the necessary printed forms on which the order will be duplicated. Each form is standard to take the basic information from the master sheet, yet specially designed to serve its special purpose. The duplicating

American Thermometer Co.

Shipped to — Cust.Order — Cust.Req. — Date Entered
Shipped
Invoice No.
Our Order 23456
Sold to — Order No.
Class of Product

Date of Order — No.Pkgs. — Terms
Salesman — Weight — Ship via
Valued at — B/L No. — FOB St.Louis,Mo.

	Qty. Order	Qty. Shipd	Description	List	Disc.	Net	

Master Carbon Sheet

EXHIBIT 1

machine operator runs off one or more copies of each form, as required. One copy is retained in the duplicator room file, and all other copies are sent to the billing clerk.

The billing clerk retains the copies which she will need, and immediately sends all other copies to the proper departments. The use and routing of all copies will be discussed in detail. It should

be noted that it requires approximately four hours to get the order approved, written up, and duplicated.

Copies Required

The various copies of the order which are required in this plant are listed below:

1. Acknowledgment to customer.
2. Acknowledgment to salesman.
3. Sales analysis copy.
4. General file copy.
5. Duplicator file copy.
6. Inventory control copy.
7. Production scheduling copy.
8. Final assembly department copy.
9. Shipping department copy.
10. Cost record copy.
11. Original billing copy to customer.
12. Duplicate billing copy to customer.
13. Accounts receivable copy.
14. General accounting copy for salesman's commissions.
15. Shipping notice to customer.
16. Shipping notice to salesman.
17. Packing slip.

When the duplicator master method is used, the number of copies may be increased or decreased at will without disturbing any of the procedure.

Sales Analysis

The acknowledgment to the customer and the salesman are mailed immediately by the billing clerk. This constitutes notice to them that the order has been received and entered.

The sales analysis copy of the customer order is shown in full as Exhibit 2. This is a specially designed analysis card using a well-known standard coding system. It is so designed that the sales department may make any analysis of unfilled orders or shipments within just a few minutes. This card is filed in order serial number in the unfilled orders file until shipped. It is then transferred to the shipped file. The back of this form is ruled to provide the data needed in reporting to the Government on un-

filled orders and shipments, and all analyses for this purpose are made from this card. Also, all internal sales analysis by product class, salesman, territory, and customer is made from the same card. Analysis change is accomplished at any time by simply changing the coding on the card.

The general file copy is sent to the general file clerk and filed by customer name. It serves in that file to check the original customer purchase order. The duplicator file copy is retained by the duplicating machine operator and filed by order serial number. She shows on this copy the number of copies of the order which were duplicated.

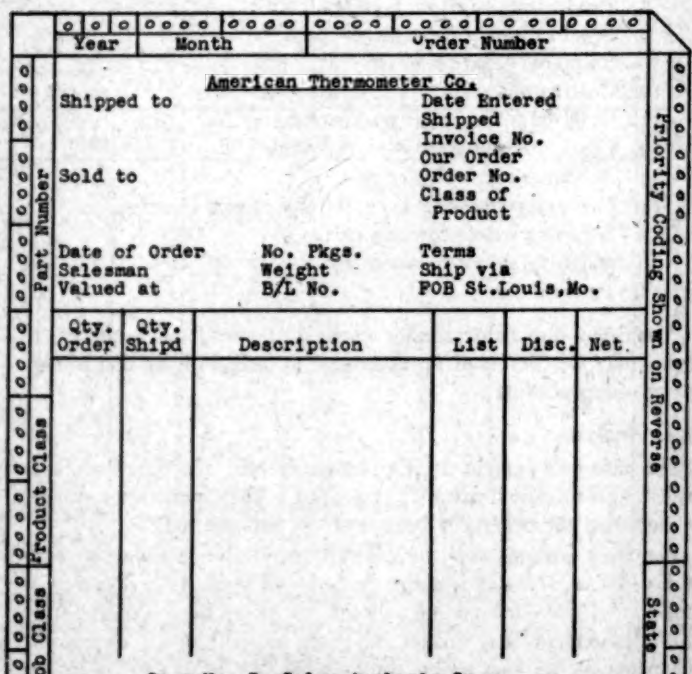

EXHIBIT 2—FRONT VIEW

Inventory Control and Production Scheduling

The inventory control copy is sent to the inventory control department by the billing clerk as notice of receipt of the order. This copy also is a coded copy, and is used by the inventory control department as a follow-up on production scheduling. It also is used as a check on the assignment of parts as shown in the perpetual inventory records. When the order is shipped, this copy is filed in the inventory control department by order serial number.

The production scheduling copy is first sent to the inventory control office by the billing clerk. This enables the inventory office to show on the back of this copy the parts available for assembly of the order. Since most customer orders are produced from standard stock parts, the production control office must know that sufficient parts are already available, or be advised of the date when all parts will be available. Only then can proper scheduling of the order be accomplished. The balance of parts shown on this order is the unassigned balance, not the actual stock balance. The unassigned balance is composed of the actual stock balance, plus the total of parts on order which have not already been earmarked for other customer orders. These balances are carried in the perpetual inventory records. Also shown on the back of this copy is the standard parts list from which the product is assembled. It is from this list that the production control office requisitions the parts from the stock rooms to be delivered to the final assembly line. Any changes in this standard parts list is reported to the inventory control office, and the list maintained up to date by them. When the scheduled assembly date is determined, this copy of the order is placed in a tickler file in the production control office as a follow-up on the order. When the order is shipped, this copy is filed by customer name in the production control office.

Assembly and Shipping

The final assembly department copy is sent directly to the production control office by the billing clerk. It serves there as a check on the inventory control office until the production copy is sent through. When the scheduled assembly date is determined, this copy is sent to the foreman of the final assembly department. At the same time, the production control office requisitions the parts from the stock rooms, with future delivery dates noted. This

bit of procedure enables the assembly department foreman to schedule his activitity, and enables the stock department to plan delivery of the parts. When the assembly is completed, this copy goes to the shipping department. It is checked with the shipping order, then sent to the production control office, where it is checked against the daily shipments report furnished by the inventory control office. It is then filed by product part number in the production control office.

The shipping department copy accompanies the final assembly copy to the production control office. It is released to the shipping department as soon as a scheduled shipping date is determined. This gives the shipping department sufficient time to requisition shipping supplies. When the order is shipped, the shipping copy is returned to the inventory control office. It is used there to compile a daily shipments report and is then sent to the billing clerk. The billing clerk uses it to complete her work on the copies of the order which she still retains, then files it in the shipped orders file.

The Cost Record

The cost record copy is also cleared through the inventory control department by the billing clerk. If the product is standard, a copy of the standard parts list is run on the back of this copy. If this parts list does not agree with the standard cost record when this copy is received in the cost department, an investigation is made and necessary changes made in standard costs. If the product is non-standard, no parts list will be available, and the job is run through the plant on a time and material basis. The cost copy of the order then serves the cost department as an accumulation record for material and labor charges. When the job is completed a total job cost is available for billing the customer. When the order is shipped, the cost record copy of the order serves as a cost of sales record. A summary of all shipments is made from these cards and verified with the sales analysis record of shipments. The cost of sales is thus verified monthly.

Billing

The original and duplicate billing copies are retained by the billing clerk pending shipment of the order. When shipment is made, the shipping order serves the billing clerk with the information

necessary to complete the billing to the customer. The quantity shipped and total value are shown on the billing copies, then they are forwarded to the general accounting office for checking and mailing.

The accounts receivable copy is also retained by the billing clerk until shipment is made. The quantity shipped is shown on the accounts receivable copy, and this copy forwarded to the accounts receivable ledger clerk. This clerk also posts all sales analysis cards. She makes her ledger entry, then posts the sales analysis card. This copy is then filed in the accounts receivable invoice file as proof of the invoicing.

The billing clerk enters on the salesman's commisison copy the quantity shipped and the extended value of the shipment. She forwards this copy to the general accounting office, where a voucher is prepared covering the payment of the commission. This copy is then filed with the voucher as evidence of the obligation.

The shipping notice to the customer and to the salesman are retained by the billing clerk until shipment is made, then the shipment data entered and the copies mailed. This serves as notice to the customer that shipment and invoice will be received within a few days. It serves the salesman as notice that commissions will be credited to his account.

The packing slip accompanies the shipping order at all times until the shipment is made. It is then placed in the package with the product. It serves the customer identification of the product when he receives it.

Partial Shipments and Order Changes

In the event that only partial shipment of the order is made, the billing clerk will write a balance order when she receives the original shipping order from the inventory control office. She writes the balance order simply by taking out of her file the original master sheet, adding a suffix number to the original serial number, and showing the new balance on order. All copies of this balance order will be made up by the duplicating machine operator as though it were an original order. The copies will then follow the same procedure as though they were an original order.

In event an order is cancelled or changed by the customer, all copies are recalled by the billing clerk through the use of a change

order ticket. In event of a change in an order which has already been started in manufacture, the original order is allowed to remain in the shop, but the change order notice is attached to each copy of the order. Increases in customer orders are covered by issuing a new order altogether.

If more than one item is ordered by the customer on one purchase order, all items are written up on he same billing order. If shipment of all items is not effected at once, balance orders are written until all items are shipped.

Summary

In conclusion, several points should be emphasized. First, the procedure outlined has been tested in part over a period of several years. The parts of the procedure not yet fully operative are believed to be fully practical, since they are of a minor nature only. The procedure is logical, flexible, and simple of operation. It provides a focal point for the control of customer orders. It sets up the necessary internal check to avoid errors, or bring them to light quickly. It provides identical copies of the order for all departments, and does this quickly and without rewriting the order. As a by-product, the sales department obtains accurate sales analysis, and the cost, inventory control and production departments are provided with useful controls. With slight modifications to suit particular plants, this system can be used by any manufacturing plant with a minimum of installation effort. It can be adapted quickly to changing operating conditions. Finally, it provides accounting management with the basic control of the customer order so essential to prompt deliveries and profitable operation.